

# Univox® TLS-2.2

## Transportation Loop System



### Features

- Extremely high ability to overcome metal loss
- High output current, 10-30Arms (power supply related)
- High frequency gain potentiometer (MLC) on PCB
- Surface mount technology
- Insensitive to vibrations (complies with EN 50155:2017 and EN 61373:2010)
- Insensitive to extreme temperatures (complies with EN 50155:2017)
- Fire protection complies with EN 45545:2013/HL2
- Adapted for fixed installation in limited spaces
- 12-50 VDC power connection
- High quality WAGO 769 series connectors
- Balanced and galvanically isolated input
- Rugged Dip-switch input and output level settings on PCB for quick installation
- Isolated opto-coupler outputs for input and output signal check (diagnostic test)

### Univox® TLS-2.2 loop amplifier - specially designed for railway vehicles

Univox® TLS-2.2 is designed to drive hearing loops in larger vehicles completely or partially enclosed by metal, like train cars, trams, subways and ships. TLS-2.2 is a constant current amplifier with very high output current, up to 30Arms, providing compensation for the strong damping effect that conductive materials have on magnetic transmission. Metal loss correction is also available for high frequency slope corrections.

The rugged SMD construction provides high immunity to mechanical vibration and shock, complying with the requirements of EN 50155:2017 and EN 61373:2010 standards. All larger capacitors are glued onto the coated dust resistant PCB. The requirements in the fire protection standard EN 45545-2:2013 Hazard Level 2, are met.

TLS-2.2 has an efficient, fan free cooling system, for trouble free operation. It complies with the highest environmental temperature requirements of the EN 50155:2017 standard (Category TX, -40 to +85°C). Capacitors are temperature rated -40°C to +105°C. All relevant EMC and EMI demands are met according to EN 50121-3-2:2016+A1:2019. A closed metal casing and professional connectors make TLS-2.2 rated IP40. The case and signal ground are isolated through a 200V capacitor. The TLS-2.2 also features a built-in reverse polarity protection (diode) and an enhanced over-current protection (fuse). The amplifier is designed to fit and work in cramped spaces, as required in such environments. All the connectors and indicators are placed on one side of the amplifier to facilitate installation, service and control. The amplifier can be fixed mounted on site.

The balanced input, power supply, loop output and diagnostic system are connected to the amplifier using high quality WAGO 769 series connectors. Input sensitivity and output level are set by rugged DIL switches on the PCB where the metal loss correction potentiometer is also located.

TLS-2.2 can easily be connected to the diagnostic system of a computer host through the opto-coupler's isolated outputs for control of input and output signals.

<b>Power input</b>	Galvanically isolated and balanced 4 pin connector WAGO 769-664/003-000 (chassis) WAGO 769-104/021-000 (mating, cable) DC Voltage: 12-50 VDC (24 VDC recommended) The connected power supply must be fused by a 10A slow fuse LED indicator in front panel (function control) Note: Connector is shared with diagnostic output (see below)
<b>Power Consumption *) (at 24VDC)</b>	Max DC current consumption: 8A Max power consumption: approx. 200VA Average power consumption during call-outs: 50VA Quiescent power consumption: 1.5VA Max average temperature dissipation: 75W
<b>Signal input</b>	Galvanically isolated and balanced 3 pin connector WAGO 769-663/003-000 (chassis) WAGO 769-103/021-000 (mating, cable) Input sensitivity and AGC knee point is set internally (DIP switch on PCB) Input sensitivity range: 100mV-5Vrms LED indicator in front panel (for input level setting)
<b>Loop output</b>	Galvanically isolated and balanced 2 pin connector WAGO 769-662/003-000 (chassis) WAGO 769-102/021-000 (mating, cable) 10-30Arms (125ms) output depending on supplied voltage and loop load, set internally (DIP switch on PCB) LED indicator in front panel (function control)
<b>Diagnostic output</b>	Galvanically isolated and balanced 4 pin connector WAGO 769-664/003-000 (chassis) WAGO 769-104/021-000 (mating, cable) Isolated opto-coupler output for input and output signal check LED indicator in front panel (loop transmission control) Note: Connector is shared with power input (see above)
<b>Audio specification</b>	
Frequency response	75-6800Hz
Metal loss correction (MLC)	Potentiometer mounted on PCB, adjustable gain slope from 0-2.5dB/octave
Dual Action AGC	Dynamic Range: > 50-70dB (+1.5dB). Attack time: 2-500ms, Release time: 0.5-20dB/s
Filter	High slope lowpass filter 24dB/oct
<b>Safety</b>	
Isolation	Case and signal ground isolated by 200V capacitor
Reverse polarity protection	Reverse polarity protection built-in (diode)
Overvoltage protection	Enhanced over-current protection built-in (fuse, 10A slow)
Cooling	Fan free convection cooling (external heat sink)
IP class	IP40
<b>Physical</b>	
Size (max. incl. heat sink)	290 x 219 x 86mm (W x D x H) 2D mechanical drawing and 3D STEP file available on request
Weight	2.940g
Mounting options	Surface mount (screw holes in flanges)
Storage temperature	-40 to +70°C
<b>Shipping details</b>	
Part No	213112
Box size (6 units/box)	640 x 380 x 395mm (L x W x H)
Std package bulk weight (6 units)	21.6kg
<p>*) Power consumption is highly related to loop figuration, loop cable location and metal absorpion. It has to be calculated/measured for each configuration separately.</p>	



This product is designed to meet the system requirements of IEC60118-4 when correctly designed, installed, commissioned and maintained. Specification data complied according to IEC62489-1.

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The User Guide, Installation Guide and Certificate of Conformity are available on [univox.eu](http://univox.eu). This Brochure is based on the information available at the time of printing and is subject to change without notice.

